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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/724,661	12/01/2003	Qiangsheng Xiang		9419

7590 05/02/2005  
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EXAMINER

BOUTSIKARIS, LEONIDAS

ART UNIT PAPER NUMBER

2872

DATE MAILED: 05/02/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

4-A

<b>Office Action Summary</b>	<b>Application No.</b> 10/724,661	<b>Applicant(s)</b> XIANG ET AL.	
	<b>Examiner</b> Leo Boutsikaris	<b>Art Unit</b> 2872	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 01 December 2003.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-8 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-3 and 5-8 is/are rejected.
- 7) ☒ Claim(s) 4 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 01 December 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)  | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                                   | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____  |

## **DETAILED ACTION**

### ***Claim Objections***

Claims 1-8 are objected to because of the following informalities: Claim 1 should be written as a single sentence with a single period at the end.

Claims 2-8 inherit the deficiency of claim 1 from which they depend.

Appropriate correction is required.

### ***Claim Rejections - 35 USC § 112***

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claim 5 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 5 refers to a magnet core having a polygonal ring shape (line 1). However, later in the claim, "said circular ring" is recited (line 4), which lacks antecedent basis. Furthermore, assuming that the claim recites "said polygonal ring", it is not clear how the outer diameter Do and the length L of the polygonal ring are defined.

### ***Claim Rejections - 35 USC § 102***

Art Unit: 2872

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless --

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

Claims 1-3 are rejected under 35 U.S.C. 102(e) as being anticipated by anticipated by Liu (US 6,580,546).

The applied reference has a common assignee with the instant application. Based upon the earlier effective U.S. filing date of the reference, it constitutes prior art under 35 U.S.C. 102(e). This rejection under 35 U.S.C. 102(e) might be overcome either by a showing under 37 CFR 1.132 that any invention disclosed but not claimed in the reference was derived from the inventor of this application and is thus not the invention "by another," or by an appropriate showing under 37 CFR 1.131. However, it is noted by the examiner, that Fig. 6 of the above reference is exactly the same as Fig. 4 of the present application, which is labeled as "Prior Art", thus effectively establishing it as "Admitted Prior Art".

Regarding claim 1, Liu discloses a Faraday rotator device (Fig. 6) comprising:

- a) magneto-optic material 101;
- b) two semi-hard magnet cores 104 located in proximity to the magneto-optic material 101 such that the magneto-optic material is affected by the magnetic field of the semi-hard magnet cores 104;

Art Unit: 2872

c) two soft-magnet tubes 105 located in proximity to the semi-hard magnet cores 104 such that a continuous magnetic flux path from the soft magnet tube to the semi-hard magnet core can be formed;

d) a coil 102 encompassing the magneto-optic material 101, the semi-hard magnet cores 104, and the soft magnet tubes such that current passing through the coil generates a magnetic field at the location of the magneto-optic material (lines 12-43, col. 7, lines 20-21, col. 6). It is noted that “encompassing” is taken broadly to mean “to form a circle about” (Merriam-Webster’s Collegiate dictionary, tenth edition, at 380).

Regarding claim 2, the device of Fig. 6 further includes a soft magnetic adaptor comprising the edges of 105, which are vertical with respect to the light beam propagation direction.

Regarding claim 3, the semi-hard magnetic core has coercitivity in the range of 20 to 100 Oersteds (lines 48-52, col. 5).

### ***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 6-8 are rejected under 35 U.S.C. 103(a) as being unpatentable over Liu (US 6,580,546).

Art Unit: 2872

Liu discloses all the limitations of the above claims except for specifying the size, length and consequently the resistance of the magnet wire coil. It would have been obvious to one of ordinary skill in the art at the time the invention was made to make the coil wire have the claimed size characteristics, since it has been held that discovering an optimum value of a result effective variable involves only routine skill in the art. Here, the effective variable is the size and length of the coil wire, which affect the current that flows through the wire and the created magnetic field. Liu discloses that typical values of current are close to 100 mA, and the claimed ranges would provide smaller currents.

*Allowable Subject Matter*

Claim 4 is objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Claim 5 would be allowable if rewritten to overcome the rejection(s) under 35 U.S.C. 112, 2nd paragraph, set forth in this Office action and to include all of the limitations of the base claim and any intervening claims.

Claims 4-5 are allowable over the prior art of record for at least the reason that even though the prior art discloses a Faraday rotator device comprising soft-magnet and semi-hard magnet cores in proximity with the magneto-optic material, the prior art fails to teach or reasonably suggest, regarding claim 4, a Faraday rotator, wherein the semi-hard magnet core is in circular ring shape with the claimed geometrical characteristics, and regarding claim 5, a

Art Unit: 2872

Faraday rotator, wherein the semi-hard magnet core is in polygonal ring shape with the claimed geometrical characteristics, as set forth by the claimed combination.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Dr. Leo Boutsikaris whose telephone number is 571-272-2308.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Leo Boutsikaris, Ph.D.  
Primary Patent Examiner, AU 2872  
April 28, 2005



**LEONIDAS BOUTSIKARIS**  
**PRIMARY EXAMINER**